

CLAIMS

1. A safety belt device without tightly binding body, comprising a safety belt (2) with a flashboard (4), a belt retractor (1), a buckle (5), and a limiter (3) for adjusting the degree of tightness of the safety belt (2), characterized in that

the limiter (3) includes an upper and a lower housings (325, 326), a belt inlet and a belt outlet are provided on two side faces of the housings, an upper and a lower rollers (306, 303) are provided at two sides of the safety belt (2) within the housings,

the lower roller (303) is movably engaged with two lower roller supports (302, 324) which are disposed at a bottom surface of the lower housing (326), a clamping sleeve (301) is fixedly secured around the lower roller (303) at a center section thereof, electromagnets (304, 323) are mounted on the top of the lower roller supports, respectively, a ratchet wheel (322) is mounted on the lower roller (303), and a ratchet pawl (321) engaged with the ratchet wheel (322) and a spring (320) attached thereto are mounted within a shelf (330) of the lower housing (326),

a clamping sleeve (310) is fixedly secured around the upper roller (306) at a center section thereof, the upper roller (306) is movably engaged with two upper roller supports (307, 311) which are respectively disposed within two slide rails (333, 332) of the upper housing (325), springs (308, 312) are provided between the upper housing (325) and the two upper roller supports (307, 311), respectively, a ratchet wheel (316) is mounted on the upper roller (303), and a ratchet pawl (315) engaged with the ratchet wheel (316) and a spring (314) attached thereto are mounted within a shelf of the upper housing (325).

2. The safety belt device of claim 1, wherein the ratchet wheel (322) is mounted to the lower roller (303) at an outer side of the lower roller support (324), and the ratchet wheel (316) is mounted to the upper roller 306 at an outer side of the upper roller support (311).

3. The safety belt device of claim 1, wherein electromagnets (305, 313) are mounted to the bottom of the upper roller supports (307, 311) of the upper roller (306),

respectively.

4. The safety belt device of claim 1 or 3, wherein the electromagnets are connected in parallel with each other and then connected between two terminals of an accumulator cell, and a power switch (309) is serially connected between the electromagnets and the accumulator cell.

5. The safety belt device of claim 4, wherein the power switch (309) is mounted within the buckle (5) and controlled by the flashboard (4).

6. The safety belt device of claim 1 or 3, wherein a motor (318) is mounted within the lower housing (326), and an axis of the motor (318) is connected with the lower roller (303) through a coupling member (317).

7. The safety belt device of claim 6, wherein a branch circuit including the motor (318) and a timer (319) which is serially connected with the motor (318) is connected in parallel to windings of the four electromagnets (304, 305, 313, 323) which are connected in parallel to each other, which is then connected to an accumulator cell (335) through a power switch (309).

8. The safety belt device of claim 7, wherein the power switch (309) is mounted within the buckle (5) and controlled by the flashboard (4).

9. The safety belt device of claim 8, wherein the power switch (309) is a reed switch.

10. The safety belt device of claim 1 or 6, wherein the belt retractor (1) is mounted within the housings of the limiter (3).